



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Practice Test
Support Materials
2008**

**Grade 4
Science**

**NECAP SCIENCE 2008 PRACTICE TEST
GRADE 4 SUPPORT MATERIALS**

Grade 4 Science Practice Test Item Information

Practice Test Item Number	1	2	3	4	5	6	7	8	9	10
Big Idea ¹	SAE	INQ	INQ	POC	FAF	INQ	SAE	FAF	POC	SAE
Assessment Target	PS1.3	PS3.7	PS1.1	ESS1.5	ESS1.6	ESS1.1	LS1.2	LS4.8	LS1.1	PS2.4
Depth of Knowledge Code	2	2	2	2	2	1	1	2	2	2
Item Type ²	MC	MC	MC	MC	MC	MC	MC	MC	MC	CR
Answer Key	A	B	C	B	B	D	D	D	B	
Total Possible Points	1	1	1	1	1	1	1	1	1	4

¹Big Idea: NOS = Nature of Science, SAE = Systems and Energy, MAS = Models and Scale, POC = Patterns of Change, FAF = Form and Function, INQ = Scientific Inquiry

²Item Type: MC = Multiple Choice, CR = Constructed Response

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PS1.3 (K–4) SAE Students will use measures of weight (data) to demonstrate that the whole equals the sum of its parts.

- ❶ A jar weighs 100 g when empty. When water is added, the jar and water together weigh 125 g.

What is the weight of the water added to the jar?

- A. 25 g
- B. 100 g
- C. 125 g
- D. 225 g

PS3.7 (K–4) INQ Students will use data to predict how a change in force (greater/less) might affect the position, direction of motion, or speed of an object (e.g., ramps and balls).

- ❷ A student predicts that the distance an object moves depends on how hard it is pushed. He designs an experiment to test his prediction.

Which of the following is **most** important to collect during the experiment?

- A. the size of the object
- B. the distance the object moves
- C. the weight of the object
- D. the temperature of the object

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PS1.1 (K–4) INQ Students will collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility).

- 3 The roof of a house gets very hot in the summer. Light-colored roofs reflect heat. Dark-colored roofs absorb heat. The table below shows the summer temperatures of roofs on four different houses.

**Temperatures of
Roofs in the Summer**

Roof	Temperature
1	75°C
2	81°C
3	52°C
4	83°C

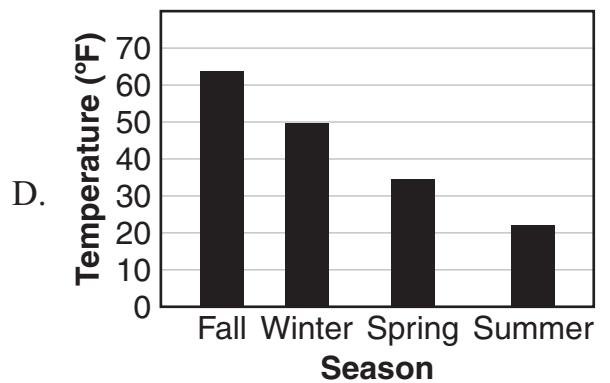
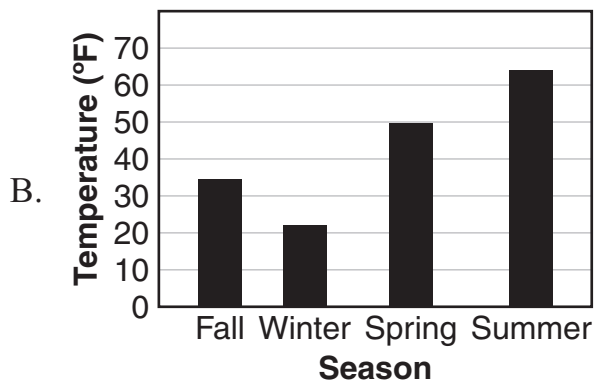
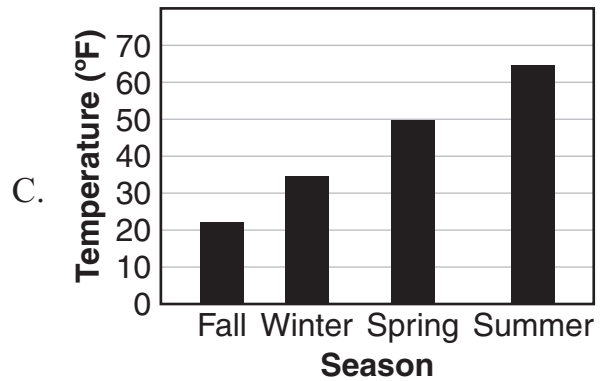
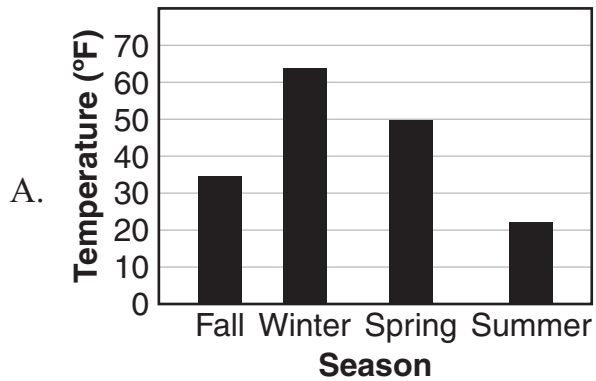
Which roof is **most likely** lightest in color?

- A. Roof 1
- B. Roof 2
- C. Roof 3
- D. Roof 4

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ESS1.5 (K–4) POC Students will, based on data collected from daily weather observations, describe weather changes or weather patterns.

- 4 Fourth-grade students in New England collected weather information. They wanted to learn the normal outside temperature for each season of the year. Which graph **best** shows the results?



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ESS1.6 (K–4) FAF Students will, given information about Earth materials, explain how their characteristics lend themselves to specific uses.

- 5** Some useful properties of copper are listed below.

- bends without cracking
- stretches without breaking
- resists rusting
- conducts heat and electricity

Based on these properties, copper is **most** useful for making which products?

- A. bridges
- B. wires for computers
- C. furniture
- D. tools for gardening

ESS1.1 (K–4) INQ Students will, given certain Earth materials (soils, rocks, or minerals), use physical properties to sort, classify, and describe them.

- 6** Which sentence **best** describes the particles in dry sand?
- A. They are all the same color.
 - B. They clump together easily.
 - C. They float in water.
 - D. They are all about the same size.

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LS1.2 (K–4) SAE Students will identify the basic needs of plants and animals in order to stay alive (i.e., water, air, food, space).

- 7** What do **all** plants need **most** to stay alive?
- A. earthworms
 - B. fertilizer
 - C. shelter
 - D. sunlight

LS4.8 (K–4) FAF Students will identify what the physical structures of humans do (e.g., sense organs - eyes, ears, skin, etc.) or compare physical structures of humans to similar structures of animals.

- 8** Human arms are **most** similar to which physical structure of birds?
- A. beak
 - B. feathers
 - C. legs
 - D. wings

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LS1.1 (K–4) POC Students will sort/classify different living things using similar and different characteristics; describe why organisms belong to each group or cite evidence about how they are alike or not alike.

- 9 The table below gives information about four different cats.

Weights and Speeds of Cats

Type of Cat	Weight (mass)	Top Running Speed
Cheetah	45 kg	100 km/hr
Leopard	80 kg	80 km/hr
Lion	225 kg	56 mph
Tiger	320 kg	38 mph

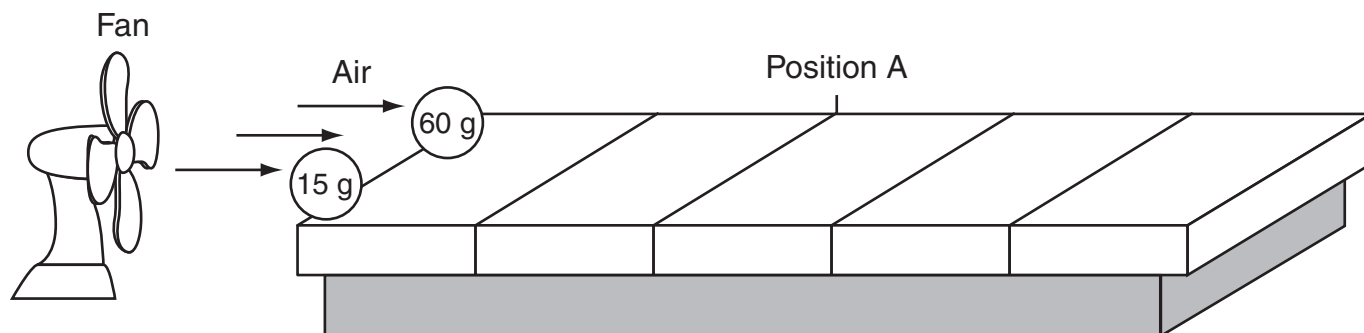
What about the table makes it **most difficult** to compare the cats?

- A. Rows are not numbered.
- B. The unit used to measure speed is not the same for all the cats.
- C. The dates on which the cats were observed are missing.
- D. Information about more cats is needed.

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PS2.4 (K–4) SAE Students will, given a specific example or illustration (e.g., simple closed circuit, rubbing hands together), predict the observable effects of energy (i.e., light bulb lights, a bell rings, hands warm up) (e.g., a test item might ask, “What will happen when . . . ?”)

- 10** A student has one 15-g ball and one 60-g ball. She sets the balls in the starting positions shown below. A fan is used to blow air toward the balls.



- a. The fan is turned on at medium speed. The 60-g ball rolls to Position A. Predict how far the 15-g ball rolls compared with the 60-g ball. Explain your reasoning.
- b. The 60-g ball is returned to the starting position. The fan is now turned on at high speed. Predict how far the 60-g ball rolls compared with how far it rolled when the fan was set at medium speed. Explain your reasoning.

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Scoring Guide

Score	Description
4	Response demonstrates a thorough understanding of the observable effects of energy. Student completes all tasks as required by predicting the distance that the fan will blow each ball at medium speed and at high speed and clearly explaining the answers. Response contains no errors or omissions.
3	Response demonstrates a general understanding of the observable effects of energy. Response contains an error or omission.
2	Response demonstrates a limited understanding of the observable effects of energy. Response contains errors and omissions.
1	Response demonstrates a minimal understanding of the observable effects of energy. Response contains several errors and omissions.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

Mathematical explanations are also acceptable.

Part a: (2 points)

The 15-g ball rolls farther than the 60-g ball because the 15-g ball is lighter. [The same amount of force (push, air, pressure, wind) is used to move both balls and the lighter ball takes less force to push.]

Part b: (2 points)

The 60-g ball will roll farther when the fan is set to high speed than when the fan is set to medium speed because the fan is blowing faster (has more air, more push, higher pressure, stronger wind).

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SCORE POINT 4

10

A. I think that the 15g ball will roll to the end because the 60g made it to Position A and it weighs more than the 15g so it should go farther.

B. IF the fan is turned on high the 60g should go to the farther bar because the wind is stronger. But on the medium speed the force was not as strong so the heavier ball won't go as far as on high.

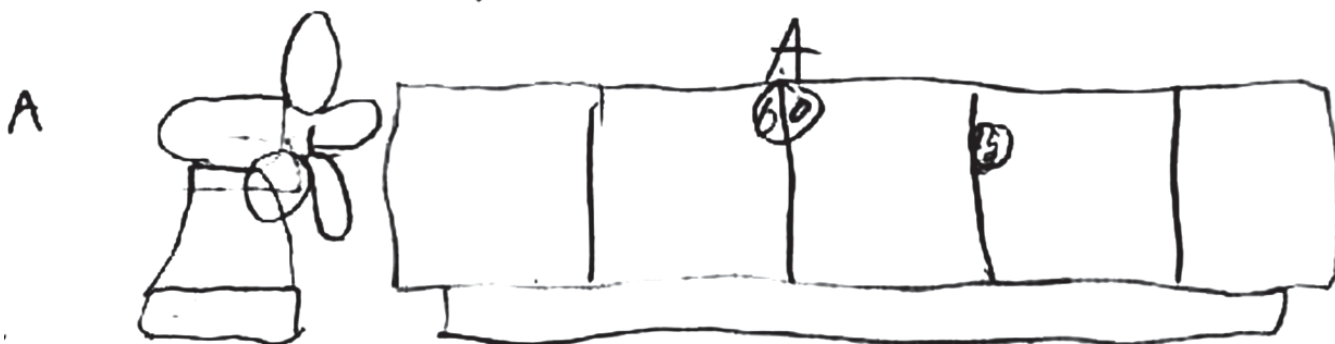
The response thoroughly and clearly answers all tasks set forth in the item. For part (a), the response provides a reasonable prediction that the 15-g ball will travel farther and gives the ball's lighter weight as a valid explanation. For part (b), the response provides a reasonable prediction that the 60-g ball will travel farther and uses the increased force of the wind coming from the fan as a valid explanation. Note that the word "force" is not needed for a score of 4. Other valid terms include but are not limited to "stronger wind," "more push," etc.

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SCORE POINT 3

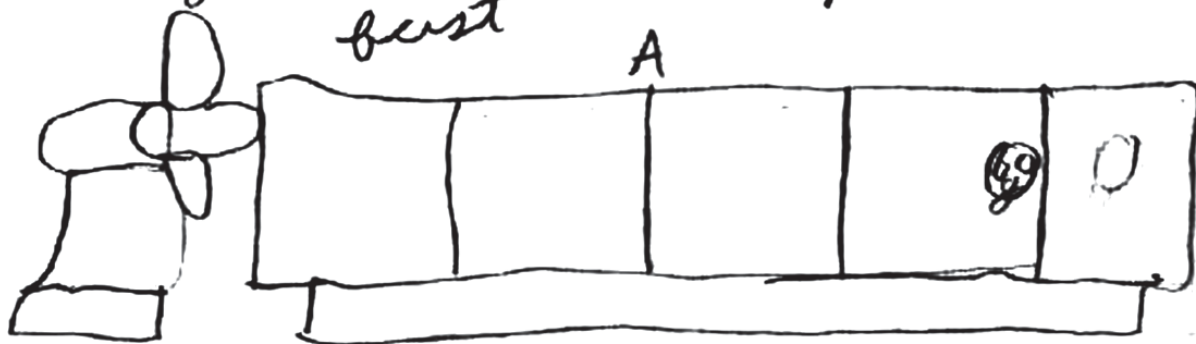
10

The 15 ball will go a little
bit farther because it is way
less



B

if it would 2 spaces to position
A on medium it would probably
go two more spaces on
fast



The response shows a general understanding of the concepts addressed. For part (a), the response provides a reasonable prediction that the smaller ball will travel farther, giving lower weight as the explanation. For part (b), the response provides a reasonable prediction that the ball will travel farther but omits the explanation that the force of the wind from the fan is the cause. Illustrations are a valid element of an explanation.

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SCORE POINT 2

10

a. The 15-g ball rolls over the edge.

b. The 60-g ball rolls two blocks past position A.

The response shows a limited understanding of the concepts addressed. This is a partial response that gives reasonable predictions for the distances the balls would roll, but it does not provide an explanation for either prediction. Responses that completely answer only part (a) or only part (b) would also receive a score of 2. Only a portion of the tasks set forth in the item are completed in this response.

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SCORE POINT 1

10

I think the 15-g ball will go farther than position
a because it has a lower number than the 20-g ball does.

The response shows a minimal understanding of the concepts addressed. For part (a), the response provides a reasonable prediction that the 15-g ball will travel farther. The explanation is not accepted because the reference to the "lower number" is too vague to demonstrate understanding. No attempt is made for part (b). Only one correct element asked for in the item is provided in the response.

SCORE POINT 0

10

A. The 60-g goes farther because it's lighter.
B. The 15-g goes a little farther because it's heavier.

The response shows no understanding of the concepts addressed. The response incorrectly indicates that the 60-g ball is lighter and makes an unreasonable prediction based on this information. For part (b), the response incorrectly indicates that the 15-g ball is heavier and makes a second unreasonable prediction on that basis. No element of the response correctly addresses the item.